SIEMENS

Data sheet

6ES7212-1BE31-0XB0

SIMATIC S7-1200, CPU 1212C, COMPACT CPU, AC/DC/RLY, ONBOARD I/O: 8 DI 24V DC; 6 DO RELAY 2A; 2 AI 0 - 10V DC, POWER SUPPLY: AC 85 - 264 V AC AT 47 - 63 HZ, PROGRAM/DATA MEMORY: 50 KB



General information	
Product type designation	CPU 1212C AC/DC/Relay
Engineering with	
 Programming package 	STEP 7 V11 SP2 or higher
Supply voltage	
Rated value (AC)	
• 120 V AC	Yes
• 230 V AC	Yes
permissible range, lower limit (AC)	85 V
permissible range, upper limit (AC)	264 V
Line frequency	
 permissible range, lower limit 	47 Hz
• permissible range, upper limit	63 Hz
Input current	
Current consumption (rated value)	80 mA at 120 V AC; 40 mA at 240 V AC
Inrush current, max.	20 A; at 264 V
Output current	

for backplane bus (5 V DC), max.	1 000 mA; Max. 5 V DC for SM and CM
Encoder supply	
24 V encoder supply	
• 24 V	Permissible range: 20.4V to 28.8V
Dewerless	
Power loss Power loss, typ.	11 W
Memory	
Work memory	
• integrated	50 kbyte
• expandable	No
Load memory	
• integrated	1 Mbyte
Backup	
• present	Yes; maintenance-free
• without battery	Yes
CPU processing times	
for bit operations, typ.	0.085 μs; / instruction
for word operations, typ.	1.7 μ s; / instruction
for floating point arithmetic, typ.	$2.5 \ \mu s; / instruction$
	2.0 µ0, / mon donom
CPU-blocks	
CPU-blocks Number of blocks (total)	DBs, FCs, FBs, counters and timers. The maximum number of
	addressable blocks ranges from 1 to 65535. There is no
Number of blocks (total)	
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Number of blocks (total) OB • Number, max. Data areas and their retentivity Retentive data area (incl. timers, counters, flags), max. Flag • Number, max. Address area I/O address area	addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used Limited only by RAM for code 10 kbyte 4 kbyte; Size of bit memory address area
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Number of blocks (total) OB • Number, max. Data areas and their retentivity Retentive data area (incl. timers, counters, flags), max. Flag • Number, max. Address area I/O address area • Inputs • Outputs Process image	addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used Limited only by RAM for code 10 kbyte 4 kbyte; Size of bit memory address area 1 024 byte
Number of blocks (total) OB • Number, max. Data areas and their retentivity Retentive data area (incl. timers, counters, flags), max. Flag • Number, max. Address area I/O address area • Inputs • Outputs Process image • Inputs, adjustable	addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used Limited only by RAM for code 10 kbyte 10 kbyte 4 kbyte; Size of bit memory address area 1 024 byte 1 024 byte 1 024 byte
Number of blocks (total) OB • Number, max. Data areas and their retentivity Retentive data area (incl. timers, counters, flags), max. Flag • Number, max. Address area I/O address area • Inputs • Outputs Process image • Inputs, adjustable • Outputs, adjustable	addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used Limited only by RAM for code 10 kbyte 10 kbyte 4 kbyte; Size of bit memory address area 1 024 byte 1 024 byte 1 024 byte 1 024 byte 1 024 byte
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Digital inputs Digital inputs Number of digital inputs • of which inputs usable for technological functions functions Source/sink input Yes Number of simultaneously controllable inputs all mounting positions up to 40 °C, max. 8 Input voltage • Rated value (DC) 24 V for signal °1° • for signal °1°, typ. Input delay (for rated value of input voltage) for standard inputs - parameterizable - at °0° to °1°, min. - at °0° to °1°, max. - parameterizable Yes for counter/technological functions - parameterizable Yes. Single phase : 3 at 100 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 at 30 kHz	Backup time	480 h; Typical
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• of which inputs usable for technological functions 4; HSC (High Speed Counting) Source/sink input Yes Number of simultaneously controllable inputs all mounting positions all mounting positions 8 —up to 40 °C, max. 8 Input voltage 5 V DC at 1 mA • for signal °0° 5 V DC at 1 mA • for signal °1° 16 V DC at 2.5 mA Input current 1 mA • for signal °1°, to standard inputs 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four - at °0° to °1°, max. 0.2 ms - at °0° to °1°, max. 1.2 ms - at °0° to °1°, max. 1.2 ms - parameterizable Yes for counter/technological functions Yes - parameterizable Yes for counter/technological functions 80 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 at 30 kHz Objetal outputs Solo m; 50 m for technological functions • unshielded, max. 500 m; 50 m for technological functions • unshielded, max. 500 m; 50 m for technological functions • unshielded, max. 500 m; 50 m for technological functions	Digital inputs	
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Number of simultaneously controllable inputs all mounting positions		4; HSC (High Speed Counting)
all mounting positions 8 — up to 40 °C, max. 8 Input voltage 24 V • for signal "0" 5 V DC at 1 mA • for signal "1" 15 V DC at 2.5 mA Input current • for signal "1", typ. • for signal "1", typ. 1 mA Input delay (for rated value of input voltage) 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four — parameterizable 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four — at "0" to "1", min. 0.2 ms — at "0" to "1", max. 12.8 ms for interrupt inputs — — parameterizable Yes for counter/technological functions — — parameterizable Yes for counter/technological functions 40 kHz & 3 at 30 kHz — parameterizable Yes, Single phase : 3 at 100 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 ot 30 kHz Output delay with resistive load, max. 500 m; 50 m for technological functions. • unshielded, max. 500 m; 50 m for technological functions. Number of digital outputs 6; Relays Not to be provided externally Switching capacity of the outputs <td>Source/sink input</td> <td>Yes</td>	Source/sink input	Yes
up to 40 °C, max. 8 Input voitage 24 V • for signal "0" 5 V DC at 1 mA • for signal "1" 15 V DC at 2.5 mA Input current - • for signal "1", typ. 1 mA Input delay (for rated value of input voitage) 1 mA Input delay (for rated value of input voitage) 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four at "0" to "1", min. 0.2 ms at "0" to "1", max. 12.8 ms for interrupt inputs - parameterizable Ves for counter/technological functions - parameterizable Yes Sou max. 500 m; 50 m for technological functions parameterizable Ves Sou my: For technological functions parameterizable Sou m; 50 m for technological functions unshielded, max. 300 m; For technological functions: No Digital outputs 6; Relays Number of digital outputs 6; Relays Short-circuit protection No; to be provided externally Switching capacity of the outputs 2A • with resistive load, max. 2A • on lamp load, max. 2A • on lamp load, max. 2A • on 'amp	Number of simultaneously controllable inputs	
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 for signal "0" for signal "1" 5 V DC at 1 mA for signal "1", typ. 1 mA Input delay (for rated value of input voltage) for standard inputs - parameterizable - at "0" to "1", min. 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four - at "0" to "1", min. 0.2 ms - at "0" to "1", max. 12.8 ms for interrupt inputs - parameterizable Yes for counter/technological functions - parameterizable Yes; Single phase : 3 at 100 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 at 30 kHz. Cable length Solo m; 50 m for technological functions unshielded, max. 500 m; 50 m for technological functions Short-circuit protection No; to be provided externally Switching capacity of the outputs with resistive load, max. 2 A on lamp load, max. 2 A on lamp load, max. 10 ms; max. 	Input voltage	
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• for signal "1", typ. 1 mA Input delay (for rated value of input voltage) for standard inputs - parameterizable 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four - at "0" to "1", min. 0.2 ms - at "0" to "1", max. 12.8 ms for interrupt inputs - - parameterizable Yes for counter/technological functions - - parameterizable Yes; Single phase : 3 at 100 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 at 30 kHz, differential: 3 at 80 kHz Cable length 500 m; 50 m for technological functions • unshielded, max. 500 m; 50 m for technological functions • unshielded, max. 300 m; For technological functions Number of digital outputs 6; Relays Short-circuit protection No; to be provided externally Switching capacity of the outputs 2 A • with resistive load, max. 2 A • on lamp load, max. 2 A • Output delay with resistive load 10 ms; max.	• for signal "1"	15 V DC at 2.5 mA
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for standard inputs	● for signal "1", typ.	1 mA
	Input delay (for rated value of input voltage)	
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for interrupt inputs Yes for counter/technological functions	— at "0" to "1", min.	0.2 ms
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for counter/technological functions — parameterizable Yes; Single phase : 3 at 100 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 at 30 kHz Cable length • shielded, max. • shielded, max. 500 m; 50 m for technological functions • unshielded, max. 300 m; For technological functions • unshielded, max. 300 m; For technological functions Short-circuit protection 6; Relays Short-circuit protection No; to be provided externally Switching capacity of the outputs 2 A • with resistive load, max. 2 A • on lamp load, max. 30 W with DC, 200 W with AC Output delay with resistive load 10 ms; max.	for interrupt inputs	
— parameterizableYes; Single phase : 3 at 100 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 at 30 kHzCable length.• shielded, max.500 m; 50 m for technological functions• unshielded, max.300 m; For technological functions: NoDigital outputsNumber of digital outputs6; RelaysNumber of digital outputs6; RelaysShort-circuit protectionNo; to be provided externallySwitching capacity of the outputs2 A• with resistive load, max.2 A• on lamp load, max.30 W with DC, 200 W with ACOutput delay with resistive load10 ms; max.	— parameterizable	Yes
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• unshielded, max.300 m; For technological functions: NoDigital outputs6; RelaysNumber of digital outputs6; RelaysShort-circuit protectionNo; to be provided externallySwitching capacity of the outputs2 A• with resistive load, max.2 A• on lamp load, max.30 W with DC, 200 W with ACOutput delay with resistive load10 ms; max.	Cable length	
Digital outputs 6; Relays Number of digital outputs 6; Relays Short-circuit protection No; to be provided externally Switching capacity of the outputs • • with resistive load, max. 2 A • on lamp load, max. 30 W with DC, 200 W with AC Output delay with resistive load 10 ms; max.	• shielded, max.	500 m; 50 m for technological functions
Number of digital outputs 6; Relays Short-circuit protection No; to be provided externally Switching capacity of the outputs • • with resistive load, max. 2 A • on lamp load, max. 30 W with DC, 200 W with AC Output delay with resistive load 10 ms; max.	• unshielded, max.	300 m; For technological functions: No
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Switching capacity of the outputs • with resistive load, max. 2 A • on lamp load, max. 30 W with DC, 200 W with AC Output delay with resistive load 10 ms; max.	Number of digital outputs	6; Relays
• with resistive load, max. 2 A • on lamp load, max. 30 W with DC, 200 W with AC Output delay with resistive load 10 ms; max.		No; to be provided externally
 on lamp load, max. Output delay with resistive load "0" to "1", max. 10 ms; max. 	Switching capacity of the outputs	
Output delay with resistive load • "0" to "1", max. 10 ms; max.	• with resistive load, max.	2 A
• "0" to "1", max. 10 ms; max.	• on lamp load, max.	30 W with DC, 200 W with AC
	Output delay with resistive load	
• "1" to "0", max. 10 ms; max.	• "0" to "1", max.	10 ms; max.
	• "1" to "0", max.	10 ms; max.

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Switching frequency	
• of the pulse outputs, with resistive load, max.	1 Hz
Relay outputs	0
 Number of relay outputs 	6
 Number of operating cycles, max. 	mechanically 10 million, at rated load voltage 100 000
Cable length	
• shielded, max.	500 m
• unshielded, max.	150 m
Analog inputs	
Number of analog inputs	2
Input ranges	
Voltage	Yes
Input ranges (rated values), voltages	
• 0 to +10 V	Yes
 Input resistance (0 to 10 V) 	≥100k ohms
Cable length	
• shielded, max.	100 m; twisted and shielded
Analog outputs	
Number of analog outputs	0
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
 Resolution with overrange (bit including sign), 	10 bit
max.	
 Integration time, parameterizable 	Yes
Conversion time (per channel)	625 μs
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
1. Interface	
Interface type	PROFINET
Physics	Ethernet
Isolated	Yes
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Functionality	
PROFINET IO Controller	Yes
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIBUS	Yes

AS-Interface	Yes
Protocols (Ethernet)	
• TCP/IP	Yes
Open IE communication	
• ISO-on-TCP (RFC1006)	Yes
Further protocols	
• MODBUS	Yes
Communication functions	
S7 communication	
• supported	Yes
• as server	Yes
• as client	Yes
Open IE communication	
• TCP/IP	Yes
• UDP	Yes
Web server	
• supported	Yes
User-defined websites	Yes
Test commissioning functions Status/control	
	Yes
Status/control variable	
Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
Forcing	
• Forcing	Yes
Diagnostic buffer	
• present	Yes
Integrated Functions	
Number of counters	4
Counting frequency (counter) max.	100 kHz
Frequency meter	Yes
controlled positioning	Yes
PID controller	Yes
Number of alarm inputs	4
Potential separation	
Potential separation digital inputs	
 Potential separation digital inputs 	500V AC for 1 minute
• between the channels, in groups of	1
Potential separation digital outputs	
 Potential separation digital outputs 	Relays
• between the channels	No

• between the channels, in groups of

2

Permissible potential difference between different circuits

500 V DC between 24 V DC and 5 V DC

EMC	
Interference immunity against discharge of static electri	city
 Interference immunity against discharge of 	Yes
static electricity acc. to IEC 61000-4-2	
— Test voltage at air discharge	8 kV
 Test voltage at contact discharge 	6 kV
Interference immunity to cable-borne interference	
 Interference immunity on supply lines acc. to IEC 61000-4-4 	Yes
 Interference immunity on signal cables acc. to IEC 61000-4-4 	Yes
Interference immunity against voltage surge	
 on the supply lines acc. to IEC 61000-4-5 	Yes
Interference immunity against conducted variable distur	bance induced by high-frequency fields
 Interference immunity against high-frequency radiation acc. to IEC 61000-4-6 	Yes
Emission of radio interference acc. to EN 55 011	
 Limit class A, for use in industrial areas 	Yes; Group 1
• Limit class B, for use in residential areas	Yes; When appropriate measures are used to ensure compliance with the limits for Class B according to EN 55011
Degree and class of protection	
Degree and class of protection Degree of protection acc. to EN 60529	
	Yes
Degree of protection acc. to EN 60529	Yes
Degree of protection acc. to EN 60529 • IP20	Yes
Degree of protection acc. to EN 60529 • IP20 Standards, approvals, certificates	
Degree of protection acc. to EN 60529 • IP20 Standards, approvals, certificates CE mark	Yes
Degree of protection acc. to EN 60529 • IP20 Standards, approvals, certificates CE mark CSA approval	Yes Yes
Degree of protection acc. to EN 60529 • IP20 Standards, approvals, certificates CE mark CSA approval UL approval	Yes Yes Yes
Degree of protection acc. to EN 60529 • IP20 Standards, approvals, certificates CE mark CSA approval UL approval cULus	Yes Yes Yes Yes
Degree of protection acc. to EN 60529 • IP20 Standards, approvals, certificates CE mark CSA approval UL approval cULus FM approval	Yes Yes Yes Yes Yes
Degree of protection acc. to EN 60529 • IP20 Standards, approvals, certificates CE mark CSA approval UL approval cULus FM approval RCM (formerly C-TICK) Marine approval Ambient conditions	Yes Yes Yes Yes Yes
Degree of protection acc. to EN 60529 • IP20 Standards, approvals, certificates CE mark CSA approval UL approval cULus FM approval RCM (formerly C-TICK) Marine approval Ambient conditions Free fall	Yes Yes Yes Yes Yes Yes
Degree of protection acc. to EN 60529 • IP20 Standards, approvals, certificates CE mark CSA approval UL approval cULus FM approval RCM (formerly C-TICK) Marine approval Free fall • Fall height, max.	Yes Yes Yes Yes Yes Yes
Degree of protection acc. to EN 60529 • IP20 Standards, approvals, certificates CE mark CSA approval UL approval cULus FM approval RCM (formerly C-TICK) Marine approval Ambient conditions Free fall	Yes Yes Yes Yes Yes Yes Yes O.3 m; five times, in product package
Degree of protection acc. to EN 60529 • IP20 Standards, approvals, certificates CE mark CSA approval UL approval cULus FM approval RCM (formerly C-TICK) Marine approval Free fall • Fall height, max.	Yes Yes Yes Yes Yes Yes Yes O.3 m; five times, in product package -20 °C
Degree of protection acc. to EN 60529 • IP20 Standards, approvals, certificates CE mark CSA approval UL approval cULus FM approval RCM (formerly C-TICK) Marine approval Ambient conditions Free fall • Fall height, max. Ambient temperature during operation	Yes Yes Yes Yes Yes Yes Yes O.3 m; five times, in product package

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 horizontal installation, max. 	00 °C
• vertical installation, min.	-20 °C
 vertical installation, max. 	50 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Air pressure acc. to IEC 60068-2-13	
• Operation, min.	795 hPa
• Operation, max.	1 080 hPa
 Storage/transport, min. 	660 hPa
 Storage/transport, max. 	1 080 hPa
 permissible operating height 	-1000 to 2000 m
Relative humidity	
• Operation, max.	95 %; no condensation
Vibrations	
Vibrations	2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail
 Operation, tested according to IEC 60068-2-6 	Yes
Shock test	
 tested according to IEC 60068-2-27 	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
	value), duration in ms
Extended ambient conditions	value), duration in ms
Extended ambient conditions Pollutant concentrations	
	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Pollutant concentrations	
Pollutant concentrations — SO2 at RH < 60% without condensation	
Pollutant concentrations — SO2 at RH < 60% without condensation Configuration	
Pollutant concentrations — SO2 at RH < 60% without condensation Configuration Programming	
Pollutant concentrations — SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Pollutant concentrations — SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Pollutant concentrations — SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free Yes Yes
Pollutant concentrations — SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free Yes Yes
Pollutant concentrations — SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free Yes Yes Yes
Pollutant concentrations — SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free Yes Yes Yes 90 mm
Pollutant concentrations SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free Yes Yes Yes Yes
Pollutant concentrations — SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free Yes Yes Yes 90 mm
Pollutant concentrations SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free Yes Yes Yes 90 mm 100 mm
Pollutant concentrations SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free Yes Yes Yes 90 mm 100 mm